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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/051,815	01/11/2002	Andreas Held	56714 (45553)	6015
21874	7590	03/07/2005	EXAMINER	
EDWARDS & ANGELL, LLP			CHANG, JON CARLTON	
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BOSTON, MA 02205			ART UNIT	PAPER NUMBER
			2623	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/051,815	HELD, ANDREAS	
	Examiner	Art Unit	
	Jon Chang	2623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

Claim Objections

1. Claim 12 is objected to because of the following informalities:

In claim 12, at line 3, "protect" should read, "project".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. Claims 1-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a) A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, the claims recite the broad recitation "a predefined image pattern", and the claim also recites "in particular a human

eye" which is the narrower statement of the range/limitation. An addition, similar problem exists in claim 2, which recites the broad recitation "a Hough transform" and the narrower statement of the limitation, "in particular a gradient decomposed Hough transform." For purposes of this Office Action, it is assumed that "a human eye" is a required feature of the claims, and the "gradient decomposed Hough transform" is required in claim 2.

b) Regarding claims 14 and 15, the term "e.g" renders the claim indefinite because it is unclear whether the limitation(s) following the phrase ("a human eye") are part of the claimed invention. See MPEP § 2173.05(d).

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 3-4 and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 5,859,921 to Suzuki.

As to claim 1, Suzuki discloses a method for automatically detecting a pre-defined image pattern, in particular a human eye, in an original picture, comprising the following steps:

a) pixel data from said original picture are looked through by means of a processing step, including at least one transform, to find the pre-defined image pattern, in particular a human eye (column 3, lines 10-15; transforms involve the various processing, column 20, lines 4-56), characterized in that

b) said processing step is split up into at least two stages, including:

b1) a first stage with a coarse processing step to detect locations in the original picture imposing an increased likelihood that the pre-defined image pattern, in particular a human eye, can be found there (column 20, lines 24-49. Eye candidate areas are set. Because the eye seeking area is restricted, the likelihood that the eye can be found there is increased over the eye searching areas discussed at column 20, lines 4-23);

b2) a second stage with a refined processing to be applied to the locations to identify the pre-defined image pattern, in particular a human eye (column 20, lines 50-56+; the eyes are actually detected here among the candidate areas).

Regarding claim 3, Suzuki discloses the method according to claim 1, wherein the first stage additionally includes pre-processing step to modify the image in accordance with generally existing features of the image pattern searched for, in particular a human eye (column 17, lines 56-60; column 18, lines 39-41; column 20, lines 4-23; note that in this regard, what constitutes the first stage is arbitrary, as long as it occurs before the second stage.).

Regarding claim 4, Suzuki discloses the method according to claim 1, wherein the first stage additionally includes another pre-processing step according to which

areas of an original picture are omitted for which the likelihood is low that the pre-defined image pattern, in particular a human eye, can be found therein (column 20, lines 4-23; since the eyes are contained in the eye searching areas, the other areas, which are omitted, have low likelihood that the eyes can be found there).

With regard to claim 16, Suzuki discloses an image processing device for processing image data, including:

- a) an image data input section (Fig.1, element 1),
- b) an image data processing section (Fig.1, elements 4, 5, 6 and c),
- c) an image data recording section for recording image data (Fig.2, element 11),

wherein the image data processing section is embodied to implement a method according to claim 1 (column 2, line 65 to column 3, lines 15; see remarks provided above for claim 1).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 2, 5 and 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Suzuki and the article, "Locating Facial Features with Color Information" by Zhang et al. (hereinafter "Zhang").

With regard to claim 2, Suzuki does not disclose that at least one of the stages uses a Hough transform, and in particular a gradient decomposed Hough transform. However, in an analogous environment, Zhang teaches the gradient decomposed Hough transform for locating eyes (see abstract and section 4). Zhang states that use of this transform results in more accuracy (next to last sentence of section 1). Therefore, it would have been obvious to one of ordinary skill in the art to modify Suzuki's invention to utilize the gradient decomposed Hough transform as taught by Zhang.

With regard to claim 5, Suzuki does not disclose that the first stage includes that the image data, and in particular the pre-processed image data of the original picture, is directed to a gradient calculation processing to achieve gradient information to be processed further. However, in an analogous environment, Zhang teaches the gradient decomposed Hough transform for locating eyes (see abstract and section 4). Zhang states that use of this transform results in more accuracy (next to last sentence of section 1). Therefore, it would have been obvious to one of ordinary skill in the art to modify Suzuki's invention to utilize the gradient decomposed Hough transform as taught by Zhang. In incorporating the gradient decomposed Hough transform, a gradient calculation processing to achieve gradient information is required (Official Notice). Note also, as a requisite for performing the transform, Zhang describes prior edge detection employing the Sobel operator (see first two paragraphs of section 4). The Sobel operator results in gradient information.

As to claim 8, in Zhang's teaching, the resulting image data is directed to a

gradient decomposed Hough transform (see remarks above for claim 5) and is modified, in particular to fit curves and/or circles (the Examiner takes Official Notice that this is inherent in the form of the gradient decomposed Hough transform; note also the statement in Zhang, "We find the centers of the tangent circles by Hough Transform."), modification being done in accordance with basic shape features of the searched image pattern, in particular a human eye (the basic shape feature can be seen in Fig.4 of Zhang).

With regard to claim 9, while Zhang is silent with respect to the equations recited in the claim, the Examiner takes Official Notice that by definition, the gradient decomposed Hough transform includes these equations.

With regard to claim 10, Zhang teaches finding minima to find the centers of the patterns (see third and fourth paragraphs of section 4). This is equivalent to the claimed maximum because whether something is a minimum or maximum is arbitrary, depending on the brightness reference being used (e.g., whether "on" pixels are considered as "1" or "0"). Note also while Zhang refers to "minima," Figure 5, which is being described, actually shows two maxima. It is possible that Zhang may have inadvertently used the opposite term. In either case, Zhang is performing the same process. Zhang is silent with regard to the two-dimensional accumulator (although this could be implied by the use of the term "histogram"). However, two-dimensional accumulators are inherent in the Hough transform (Official Notice), which is utilized by Zhang.

Allowable Subject Matter

7. Claims 6-7 and 11-15 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

References Cited

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent 5,719,951 to Shackleton et al. teaches locating eyes in a face image by restricting the search to particular areas in the image, and performing coarse and fine stages for locating the eyes.

U.S. Patent 6,094,498 to Okumura discloses a face image processing apparatus which estimates eye candidate areas and decides eyes within the candidate areas.


"System for Description and Identification of Individuals" by Vezjak et al. teaches dividing the face image into thirds and searching the middle third for the eyes, edge detection and the Hough transform.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jon Chang whose telephone number is (703)305-8439. The examiner can normally be reached on M-F 8:00 a.m.-6:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on (703)308-6604. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Jon Chang
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Art Unit 2623

Jon Chang
March 7, 2005